CLAIMS

What is claimed is:

1. A universal fin for use in a fin on tube heat exchanger, the universal fin comprising:

a sheet of heat conducting material configured to be separated to form one or more fins for use on the fin on tube heat exchanger regardless of a number of vertical and horizontal pairs of tubing segments in said heat exchanger, said sheet having a width and a height; and

a plurality of openings in said sheet, each of said openings configured to allow a pair of generally parallel tubing segments of the heat exchanger to pass therethrough, said openings being canted relative to said width and height of said sheet, said openings being arranged on said sheet into a plurality of rows and a plurality of columns with adjacent rows being generally equally spaced apart and adjacent columns being generally equally spaced apart, and said spacing between adjacent rows and adjacent columns being dimensioned to allow said sheet to be separated between at least one of said adjacent rows and said adjacent columns to form one or more fins each containing a plurality of openings at least equal to a total number of pairs of tubing segments in the heat exchanger.

2. The universal fin of claim 1, wherein said openings are elongated openings with each opening having opposite end portions interconnected by a central portion.

3. The universal fin of claim 2, wherein said openings are dog-bone shaped.

4. The universal fin of claim 1, further comprising indicia on said sheet indicating locations where said sheet can be separated to form said fins, said indicia extending along said sheet between at least one of said columns and said rows.

5. The universal fin of claim 4, wherein said indicia is perforations in said sheet.

6. The universal fin of claim 1, wherein said columns are spaced apart such that a portion of said openings in one of said columns overlaps a portion of said openings in an adjacent column.

7. The universal fin of claim 6, wherein said adjacent columns when separated have an undulating edge.

8. The universal fin of claim 1, wherein said spacing between adjacent rows is generally equal to said spacing between adjacent columns.

9. The universal fin of claim 1, wherein each of said openings are generally identical.

10. A fin on tube heat exchanger having a fin formed from a universal fin sheet, the heat exchanger comprising:

a tube portion having a plurality of straight segments of tubing interconnected by a plurality of connecting segments of tubing with each connecting segment interconnecting two straight segments, said straight and connecting segments being arranged in a sinuous configuration, said tube portion having a known quantity of vertical and horizontal pairs of tube passes; and

at least one fin on said tube portion, said fin being separated from a universal fin sheet having a width, a height and a plurality of openings with each opening configured to allow a pair of tube passes to pass therethrough, said openings being arranged on said universal fin sheet into a plurality of rows and a plurality of columns with adjacent rows being generally equally spaced apart and adjacent columns being generally equally spaced apart, and said spacing between adjacent rows and adjacent columns being dimensioned so that said universal fin sheet can be separated between at least one of said adjacent rows and adjacent columns to form said fin having a quantity of openings at least equal to said number of pairs of tube passes regardless of a number of vertical and horizontal pairs of tube passes in said tube portion,

wherein said fin has a quantity of said openings at least equal to said number of pairs of tube passes in said tube portion and said fin is arranged on said tube portion with each pair of tube passes of said tube portion passing through one of said openings in said fin.

11. The heat exchanger of claim 10, wherein said tube portion is a single continuous tube.

12. The heat exchanger of claim 10, wherein said at least one fin is one of a plurality of fins and said plurality of fins are aligned in a generally parallel configuration with said openings in said fins being aligned to form a fin bank that is arranged on said tube portion.

13. The heat exchanger of claim 10, wherein said tube portion has more vertical tube passes than horizontal tube passes.

14. The heat exchanger of claim 10, wherein said tube portion has more horizontal tube passes than vertical tube passes.

15. The heat exchanger of claim 10, wherein said openings in said universal fin sheet are canted relative to said width and said height of said universal fin sheet.

16. The heat exchanger of claim 10, wherein said spacing between adjacent rows is generally equal to said spacing between adjacent columns.

17. The heat exchanger of claim 10, wherein said openings in said universal fin sheet are elongated openings with each opening having opposite end portions interconnected by a central portion.

18. The heat exchanger of claim 10, wherein said columns of said universal fin sheet are spaced apart such that a portion of said openings in one of said columns overlaps a portion of said openings in an adjacent column and said fin has an undulating edge.

19. A method of making a fin on tube heat exchanger, the method comprising the steps of:

(a) separating at least one fin having a predetermined quantity of openings from a preformed universal fin sheet that is configured to be separated to provide one or more fins for use on a heat exchanger regardless of a number of vertical and horizontal pairs of tube passes in a tube portion of the heat exchanger on which said at least one fin is to be used; and

(b) positioning said fin on said tube portion of said heat exchanger with pairs of tube passes passing through said openings.

20. The method of claim 19, wherein (a) includes preforming said universal fin sheet so that said universal fin sheet has a width, a height and a plurality of openings with each opening configured to allow a pair of tube passes of the heat exchanger to pass therethrough, said openings being arranged on said universal fin sheet into a plurality of rows and a plurality of columns with adjacent rows being generally equally spaced apart and adjacent columns being generally equally spaced apart, and said spacing between adjacent rows and adjacent columns being dimensioned so that said universal fin can be separated between at least one of said adjacent rows and adjacent columns to form said at least one fin regardless of a number of horizontal and vertical pairs of tube passes.

21. The method of claim 20, wherein preforming said universal fin sheet includes placing indicia on said universal fin sheet between at least one of said columns and said rows, said indicia indicating locations where said universal fin sheet can be separated to form said at least one fin.

22. The method of claim 21, wherein said indicia are perforations in said universal fin.

23. The method of claim 20, wherein (a) includes die stamping said universal fin sheet from a sheet of heat conducting material.

24. The method of claim 20, wherein preforming said universal fin sheet includes preforming said universal fin sheet with said plurality of openings canted relative to said width and height of said universal fin sheet.

25. The method of claim 19, further comprising forming a tube portion having a predetermined number of vertical and horizontal pairs of tube passes.

26. The method of claim 25, wherein forming said tube portion includes forming said tube portion with a greater number of horizontal pairs of tube passes than vertical pairs of tube passes.

27. The method of claim 25, wherein forming said tube portion includes forming said tube portion with a greater number of vertical pairs of tube passes than horizontal pairs of tube passes.

28. The method of claim 25, wherein forming said tube portion includes bending a continuous length of tubing so that said tubing forms said tube portion.

29. The method of claim 19, wherein (a) includes cutting said at least one fin from said preformed universal fin sheet.

30. The method of claim 19, wherein portions of openings in one column overlap portions of openings in an adjacent column and said fin has an undulating edge.